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ARGUS EXPLORATION COMPANY
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8 September 1972

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attn: → ERTS Program Manager, Code ER, NASA HQ
ERTS Contracting Officer, Code 245 GSFC
ERTS Technical Officer, Code 430, GSFC
ERTS Project Scientist, Code 650, GSFC
ERTS Scientific Monitor, Code 650, GSFC

Subject: Type 1 Progress Report, 15 June through 31 August 1972
Proposal - A Reconnaissance Space Sensing Investigation of
Crustal Structure for a Strip from the Eastern Sierra Nevada
to the Colorado Plateau, dated April 1971

Reference: Proposal Control No. SR103
GSFC Principal Investigator ID PRO 15
ERTS-A Contract NAS5-21809, Ira C. Bechtold, P.I.

Gentlemen:

In accordance with Article II, Item 3, and Paragraph 3.1 of the referenced
contract, we hereby report the status of our ERTS-1 investigation.

I. Contract Objectives:

- A. Analysis, interpretation and evaluation of ERTS-1 data for application
to study of regional crustal structure.
- B. Comparison and evaluation of selected available remote sensing tech-
niques, including Apollo 9, X-15 and U-2 photography.
- C. Field Investigations to confirm interpretation studies and evaluate
significance and practical applications of geologic phenomena visible
in ERTS imagery.

(E72-10071) A RECONNAISSANCE SPACE SENSING INVESTIGATION OF CRUSTAL STRUCTURE FOR A STRIP FROM THE EASTERN SIERRA I.C. Bechtold (Argus Exploration Co., Los Angeles, Calif.) 8 Sep. 1972 5 p CSCL 08G G3/13	N72-31354 Unclas 00071
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II. Summary of Work Performed:

- A. General planning and organization for investigation; organization of office equipment, procedures and personnel; pre-ERTS preparation for data handling, research specifications and purchase of image viewing and enhancement equipment.
- B. Geologic and geophysical data research relating to ERTS study area; primary focus on geology and tectonics of area from Lake Mead to Death Valley. Data sources include Pomona College, WESRAC - University of Southern California, U.S. Geological Survey.
- C. Correspondence with other scientific investigators involved in research relating to ERTS investigation. As applicable, we have engaged in exchange of preliminary data, analytical techniques and/or interpretive studies. Correspondents include:

Mr. Charles Jennings, Calif. Div. Mines & Geology
Dr. R. E. Anderson, U.S. Geological Survey
Mr. F. C. Billingsley, Jet Propulsion Lab., Pasadena
Mr. Robert Frazer, Jet Propulsion Lab., Pasadena
Dr. M. Abdel-Gawad, North American Rockwell

- D. Field reconnaissance and geologic mapping in the region between Lake Mead and Death Valley has utilized available published and unpublished geologic data in the investigation of lineaments interpreted from Apollo 9 space photography.

Specific attention was focused on the geology of the Eldorado Mountains, Nevada; the Colorado River gorge south of Hoover Dam, and western flank of the Black Mountains north of Willow Beach, Arizona.

Additional reconnaissance has included portions of the southern Muddy Mountains and northern Black Mountains, Nevada; the New York Mountains of California and Nevada; Pahrump, Amargosa and Death Valley regions of eastern California and southern Nevada. This reconnaissance was undertaken to gain a regional perspective of ground based geology, and to aid in selection of areas for future ground based mapping. Igneous and metamorphic rock specimens have been collected for future petrographic and geochemical analyses.

III. Conformance to Work Schedule:

Delay in the pending ERTS-1 launch and subsequent data distribution provided time for two months of pre-ERTS field work and literature research. This

III. Conformance to Work Schedule, Cont'd:

two-month period contrasts with the six months for pre-ERTS winter field work originally proposed. The additional four months of field investigation will be made up over the course of the investigation.

The unanticipated delays have resulted in unfortunate timing for field studies in the eastern Mojave Desert due to the extreme daytime summer temperatures. Because of these conditions, we have postponed the use of a second field team (field geologist and assistant) until approximately 15 September.

An additional inconvenience has been caused by delay in availability of existing NASA U-2 aircraft support photography, and SLAR imagery.

IV. Analysis of Research Progress and Significant Results:

The focus of geologic reconnaissance has been to select key locations for future detailed mapping. This field work has been guided by the limited available Apollo 9 photography. The correlations of space photograph interpretation to observed geology suggest favorable applications of ERTS data.

The Apollo photography has permitted a synthesis of geology over many small areas for which detailed mapping or geophysics are available. On a regional scale, this perspective has led to recognition of extensions of known fault zones, and the interrelationship of structural zones in the Lake Mead area.

In spite of unfavorable summer field conditions and delays in data availability, we feel research has progressed satisfactorily.

V. Efforts to Achieve Reliability and Recommended Changes in Operations:

Replanning in work scheduling has been keyed to take best advantage of the unplanned pre-ERTS time available for important geologic field reconnaissance and literature research and review. No further changes in operations are presently warranted.

VI. Funding Status:

As indicated in financial reports 533M and 533Q dated 15 August 1972, proposed project funding will be adequate to complete the contracted research program.

VII. Scientific Staff and Backup Personnel:

In conformance with the rate schedule submitted 28 April 1972 as an addendum to the original proposal, the following personnel are presently assigned

VII. Scientific Staff and Backup Personnel, Cont'd.

full time on the scientific staff:

Ira C. Bechtold, Principal Investigator
Mark A. Liggett, Field Geologist
Paul L. McClay, Field Assistant.

Backup personnel covered in G & A consist of the following:

Secretary
Clerk-typist
Accountant
Draftsman

VIII. Work Planned for Next Reporting Period:

- A. To coincide with receipt of first ERTS-1 data and beginning of winter field season, a second field team of one Field Geologist and Assistant will be added to the investigation.
- B. Preliminary analysis, enhancement study and evaluation of ERTS-1 sensor data is anticipated to begin in early September. Preliminary attention will be given to detailed analysis of structural lineaments studied on the basis of Apollo 9 space photography.
- C. Research will be conducted for available imagery over test area including NASA/USAF X-15 photography, U-2 photography, and SLAR imagery. Literature research, study and correspondence will continue for available unpublished geologic and/or geophysical data over relevant portions of test area.
- D. Field reconnaissance and geologic mapping will extend westward into other portions of the Basin-Range province. Specific areas will be determined on the basis of incoming ERTS-1 data. Reconnaissance will focus on selection of sites for more detailed mapping of space photograph anomalies while mapping by the second field crew will begin in selected sites along eastern portions of the New York Mountains lineament and Las Vegas Shear Zone, eastern California and southern Nevada.

IX. Authorized Reports and publications:

- A. "Applications of ERTS-A Imagery to Structural Geology"

IX. Authorized Reports and Publications, Cont'd.

An oral presentation by Mark Liggett in response to request by
NASA Headquarters;

ERTS Users News Briefing
12 July 1972
NASA HQ., Washington, D. C.

B. "Geologic Applications of Satellite Imagery - A Review of ERTS-A"

An oral presentation by Ira C. Bechtold in response to request by
NASA Headquarters:

ERTS-A launch panel discussion
21 July 1972
Vandenburg Inn
Santa Maria, California

X. Changes in Standing Order Forms:

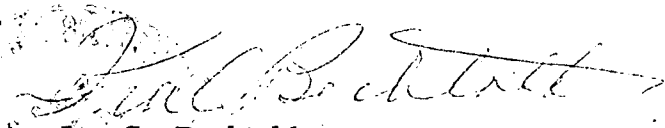
Standing Order Form submitted 24 February 1972 is currently effective.
Modification will be submitted pending official notification on status of RBV
sensor.

XI. ERTS Image Descriptor Forms:

No ERTS-1 data over test area has been received; descriptor forms do not
apply.

XII. NASA Data Request Forms:

Request for NASA SLAR data: Earth Resources Research Data Facility,
NASA-MSC, 24 July 1972. Data not received.


Ira C. Bechtold
Principal Investigator